STANFORD MICRODEVICES

Preliminary

SSW-408

DC-4 GHz High Power GaAs MMIC SPDT Switch

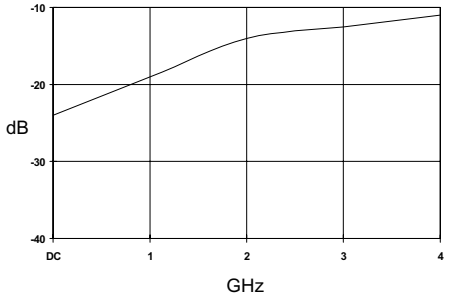
Product Description

Stanford Microdevices' SSW-408 is a high performance Gallium Arsenide Field Effect Transistor MMIC switch housed in a low-cost surface mountable small outline plastic package.

This single-pole, double-throw reflective switch consumes less than 50uA and can operate with positive or negative 3V to 8V supply voltages, making it suitable for use in both infrastructure and subscriber equipment. This switch can be used in all analog and digital wireless communication systems including (but not limited to) AMPS, PCS, DECT, IS-95, IS-136, 802.11, CDPD and GSM.

At +5V or –5V bias, typical output power at 1dB compression is 3 watts. 1dB output power over 4 watts and IP3 over +55dBm may be achieved with higher control voltages.

Isolation vs. Frequency
$V_{Control}$ = -5 V



Product Features

- **High Compression Point : up to 4 Watts**
- **HIgh Linearity : TOIP +55dBm @2GHz**
- **Low DC Power Consumption**
- **Low Insertion Loss : 1.2dB at 2GHz**
- **Operates from Positive or Negative 3V to 8V Supplies**
- **Low Cost Small Outline Plastic Package**

Applications

- **Analog/Digital Wireless Communications**
- **Spread Spectrum**
- **AMPS, PCS, DECT, IS-95, IS-136, 802.11, CDPD and GSM.**

Electrical Specifications at Ta = 25C

Symbol	Parameters & Test Conditions: Zo = 50 ohms v = +5 or -5V		Units	Min.	Typ.	Max.
Ins	Insertion Loss	f = 0.05 - 1.0 GHz f = 1.00 - 2.0 GHz f = 2.00 - 4.00 GHz	dB dB dB		0.9 1.2 1.5	1.3 1.5
Isol	Isolation	f = 0.05 - 1.0 GHz f = 1.00 - 2.0 GHz f = 2.00 - 4.00 GHz	dB dB dB	24 18	28 22 18	
VSWR on	Input & Output VSWR (on port)	f = 0.05 - 2.0 GHz f = 2.00 - 4.0 GHz			1.2 1.5	
VSWR off	Input & Output VSWR (off port)	f = 0.05 - 2.0 GHz f = 2.00 - 4.0 GHz			1.2 1.5	
P_{1dB}	Output Power @ 2.0 GHz at 1 dB Compression	V = +8V or -8V V = +5V or -5V V = +3V or -3V	dB dB dB		+36 +34 +31	
TO IP	Third Order Intercept	V = +8V or -8V V = +5V or -5V V = +3V or -3V	dB dB dB		+55 +53 +50	
Id	Device Current		uA		40	
Isw	Switching Speed 10% to 90% or 90% to 10%		nsec		10	

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SSW-408 DC-4.0GHz GaAs MMIC Switches

Truth Table

Vdd (note 1)	V1 (note 2)	V2 (note 2)	J1-J2	J1-J3
0	0	-V	Low Loss	Isolation (Hi-Z)
0	-V	0	Isolation (Hi-Z)	Low Loss
+V (note 3)	0	+V	Isolation (Hi-Z)	Low Loss
+V (note 3)	+V	0	Low Loss	Isolation (Hi-Z)

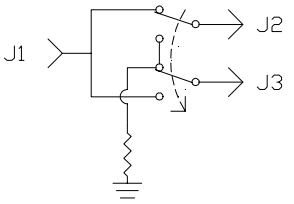
Note 1: The "Vdd" pin should be permanently connected to the most positive control voltage. If using positive (0V / 5V) control signals, Vdd = 5V. If using negative (-5V / 0V) control voltages, Vdd = 0V.
Note 2: The differential control voltage (v = |V1 - V2|) may be from 3V to 8V in magnitude.
Note 3: Decouple "Vdd" to a good RF ground, and use DC blocking capacitors on all RF pins (J1, J2, & J3).

Absolute Maximum Ratings

RF Input Power	6W Max>500MHz
Device/Control Voltage	-8V or +8V
Operating Temperature	-45C to +85C
Storage Temperature	-65C to +150C
Thermal Resistance	20 deg C/W

Caution:
Appropriate precautions in handling, packaging and testing devices must be observed.

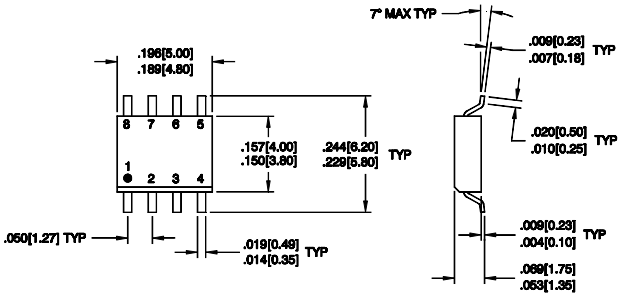
Switch Schematic



Note 1: The switch state shown is when V1 is 3v to 8v greater than V2.

Pin Out

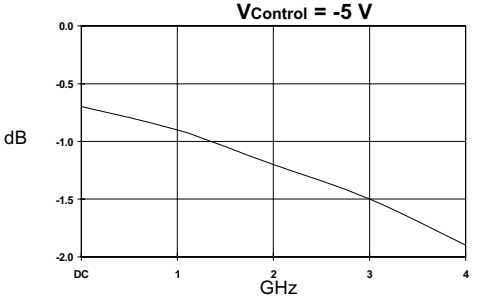
Pin	Function	Description
1	GND	Ground
2	V1	Differential Control 1
3	J1	RFin
4	V2	Differential Control 2
5	J3	RFout 2
6	Vdd	Bias Control
7	GND	Ground
8	J2	RFout 1



Pin numbers shown for reference only, not marked on part

Insertion Loss vs. Frequency

$V_{Control}$ = -5 V



On Port Input/Output VSWR vs. Frequency

$V_{Control}$ = -5 V